



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

# Accelerating Technology, Innovation and Partnerships

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*TIP Update Webinar*

*February 13, 2024*





U.S. National Science Foundation  
**Directorate for Technology, Innovation  
and Partnerships**

## TIP Directorate Mission

TIP harnesses the nation's vast and diverse talent pool to advance critical and emerging technologies, address pressing societal and economic challenges, and accelerate the translation of research results from lab to market and society. TIP improves U.S. competitiveness, growing the U.S. economy and training a diverse workforce for future, high-wage jobs.

# A New "Horizontal": Strengthen, Scale Use-Inspired and Translational Research



Integrative Activities

International Science & Engineering





# RAMPING UP TIP



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

MARCH 23

March 16:  
TIP established



May 3:  
NSF TIP launches new  
initiative, Regional  
Innovation Engines  
program

Sept. 8:  
NSF awards five new  
I-Corps™ Hubs



Sept. 19:  
NSF launches  
Entrepreneurial  
Fellows program

Nov. 10:  
NSF announces winners  
in first phase of NSF,  
NIST, OSTP, UK privacy  
prizes



Dec 8:  
NSF launches EPIIC  
program

Dec 13:  
NSF invests \$11M in  
food nutrition  
security



Dec 19:  
NSF invests \$12M in  
advanced circular  
economy

Feb 8:  
NSF launches  
ART program



Mar. 15:  
NSF launches  
Proto-OKN  
program

MARCH 22

July 20:  
NSF, NIST, OSTP, UK  
announce privacy prize  
challenge



Sept. 7:  
NSF, DOD partner to  
advance 5G security

Oct. 19:  
NSF launches ExLENT  
program



Oct. 27:  
NSF + Micron announce  
\$10M semi. workforce  
partnership

Dec 9:  
NSF invests \$12M in  
solutions for persons  
with disabilities



Dec 12:  
NSF announces Builder  
Platform for NSF  
Engines

Jan. 10:  
NSF + NobleReach  
Emerge announce  
biotechnology  
investment

Jan. 26:  
NSF announces FuSe  
program  
partnerships with  
Ericsson, Intel, IBM,  
and Samsung

# RAMPING UP TIP



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

**Apr. 3:**  
NSF announces 100  
teams advancing to  
VITAL Prize Challenge



**Apr 25:**  
NSF launches new  
\$9.5M opportunity  
to support NSF  
Engines

**June 14:**  
NSF selects 34  
semifinalists for the  
inaugural NSF Engines  
competition

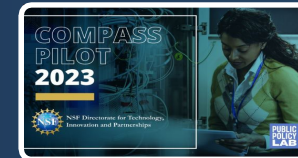


**June 22:**  
NSF releases its I-  
Corps™ Biennial report

**July 14:**  
NSF announces 54  
teams picked for the  
VITAL Prize Challenge  
Semi-Final Round

**Aug. 2:**  
NSF Regional  
Innovation Engines  
program selects 16  
teams for the  
final round of  
competition

**Sept. 15:**  
NSF launches pilot  
program to identify  
barriers and tools for  
historically  
underrepresented  
communities in the  
innovation ecosystem



**Sept. 22:**  
NSF supports the Council  
of Graduate Schools in  
efforts to broaden  
participation in the  
nation's technology  
workforce

**Sept. 26:**  
NSF invests \$26.7M in  
building the first-ever  
prototype open  
knowledge network

SEPT 23

APRIL 23

**May 5:**  
NSF partners with  
Sweden for  
research and  
innovation

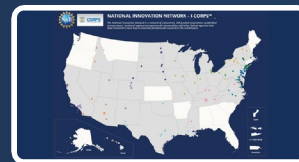
**May 11:**  
NSF announces the  
first-ever NSF  
Engines program  
awards to 44 unique



**June 26:**  
NSF, EDA announce  
official coordination  
on regional  
innovation programs



**Sept 13:**  
New NSF effort expands  
I-Corps™ Teams training  
program



**Sept. 14:**  
NSF and partners invest  
\$45M in the future of  
semiconductors

**Sept. 21:**  
NSF invests \$25M to  
advance technologies &  
communications to  
operate securely  
through 5G networks



**Sept. 27:**  
NSF invests \$18.8M in  
inaugural cohort of  
projects enabling  
experiential learning in  
key technologies



# RAMPING UP TIP



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

**Sept. 28:**  
NSF partners with the  
Institute for Progress  
to test new  
mechanisms for  
funding research and  
innovation



**Sept. 29:**  
NSF announces award for  
the NSF Engines Builder  
Platform



**Sept. 29:**  
NSF launches pilot  
program to enhance the  
potential for success of  
startups

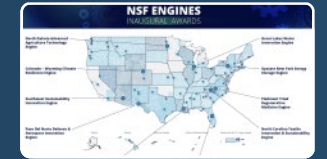
**Oct. 26:**  
NSF launches pilot to  
assess the impact of  
strategic investments on  
regional jobs



**Dec. 14:**  
NSF announces first-ever  
Accelerating Research  
Translation awards to  
empower academic  
institutions to speed and  
scale translational  
research



**Jan. 29:**  
NSF awards 10 inaugural  
NSF Engines

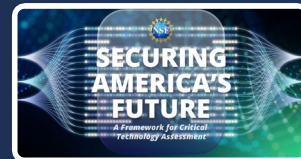


SEPT 23

**Sept. 28:**  
NSF invests \$19.6M in  
emerging research  
institutions to grow  
their capacity to  
participate in regional  
innovation ecosystems  
and announces next  
funding opportunity



**Oct. 24:**  
New report identifies  
pathways to strengthen  
U.S. competitiveness in  
key technology areas



**Oct. 25:**  
NSF invests over \$26M  
in open-source  
projects

**Nov. 28:**  
NSF announces 18 teams  
for final round of the VITAL  
Prize Challenge



**Dec. 7:**  
NSF advances  
technologies to improve  
quality of life for persons  
with disabilities

**Jan. 9:**  
NSF launches Responsible  
Design, Development, and  
Deployment of  
Technologies program





# TIP's Core Message

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development



# TIP's Core Message

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development







**NSF Convergence Accelerator** funds transdisciplinary teams through convergence research and innovation processes to stimulate innovative idea sharing and development of sustainable solutions to solve societal challenges.

Two Phases:

## PHASE I (PLANNING)

9 months  
Up to **\$750,000**

## PHASE II (IMPLEMENTATION)

24 months  
Up to **\$5 Million**



### Opportunity available to:

- Academia
- Business & Industry
- Governments
- Nonprofits

# NSF Convergence Accelerator Portfolio



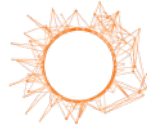
## Track A

Open Knowledge Networks



## Track B

AI and the Future of Work



## Track C

Quantum Technology



## Track D

AI-Innovation Data Sharing & Modeling



## Track E

Networked Blue Economy



## Track F

Trust & Authenticity in Communication Systems

**2019 COHORT**  
Complete

**2020 COHORT**  
Phase 2

**2021 COHORT**  
Phase 2



## Track G

Securely Operating Through 5G Infrastructure



## Track H

Enhancing Opportunities for Persons with Disabilities



## Track I

Sustainable Materials for Global Challenges



## Track J

Food & Nutrition Security



## Track K

Equitable Water Solutions



## Track L

Real-World Chemical Sensing Applications



## Track M

Bio-Inspired Design Innovations

**2022 COHORT**  
Phase 1

**2023 COHORT**  
Phase 1





## NSF Regional Innovation Engines (NSF Engines)

program supports the development of diverse, regional coalitions to engage in use-inspired research, drive research results to the market and society, promote workforce development, and ultimately stimulate the economy and create new jobs.

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NSF Engines are funded at up to **\$160 million** for up to **10** years

NSF Engine Development Awards are funded at up to **\$1 million** for up to **2** years to plan for an Engine

CHIPS and  
Science Act  
2022

### Opportunity available to:

-  Academia
-  Business & Industry
-  Governments
-  Nonprofits





# The 10 Inaugural NSF Engines

**North Dakota Advanced Agriculture Technology Engine**

**Great Lakes Water Innovation Engine**

**Colorado - Wyoming Climate Resilience Engine**

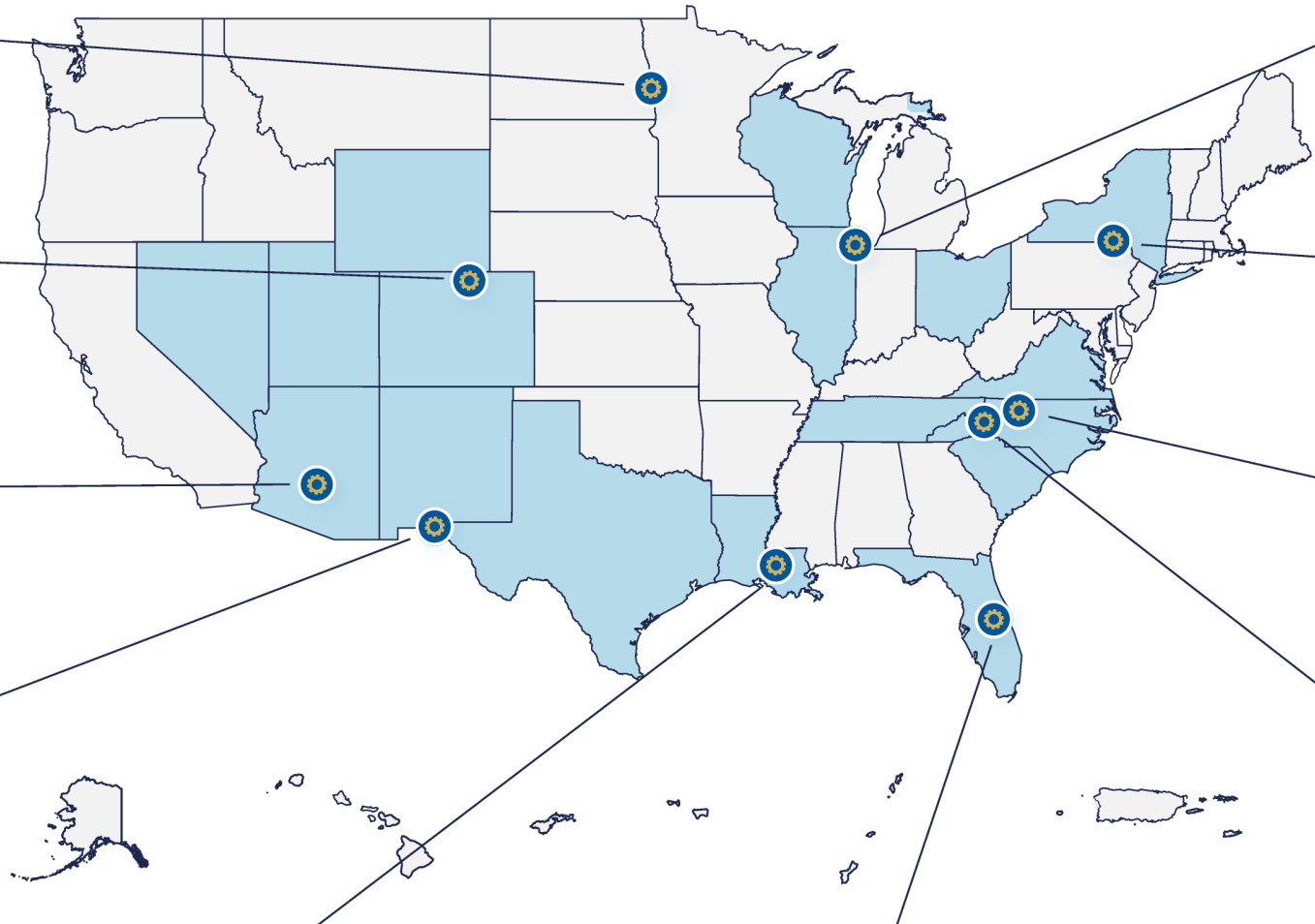
**Upstate New York Energy Storage Engine**

**Southwest Sustainability Innovation Engine**

**Piedmont Triad Regenerative Medicine Engine**

**Paso Del Norte Defense & Aerospace Innovation Engine**

**North Carolina Textile Innovation & Sustainability Engine**



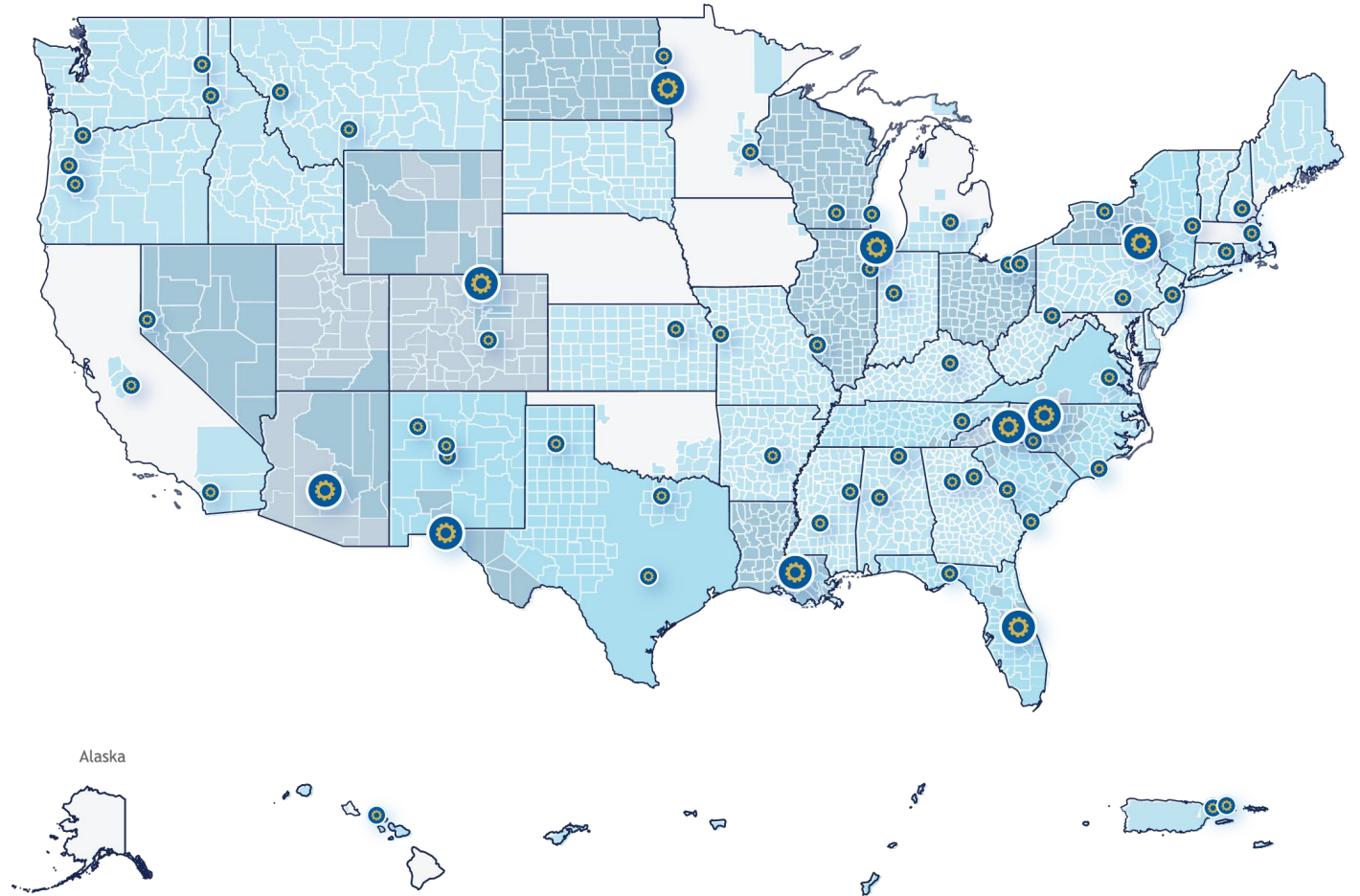
**Louisiana Energy Transition Engine**

**Central Florida Semiconductor Innovation Engine**

# NSF is Making History

NSF Engines awards represent:

- \$1.6 billion over a decade
- 450+ partners across sectors
- 18 states across 10 regions; 69 regions total across the U.S.
- 2:1 matched investment from public and private sectors
- Catalyzing America's innovation economy in all corners of the country



# Central Florida Semiconductor Innovation Engine

## Lead Organization:

ICAMR, Inc. (dba BRIDG)

## Primary Societal Challenge:

Making the U.S. a leader in semiconductor advanced packaging design and manufacturing

## Innovations:

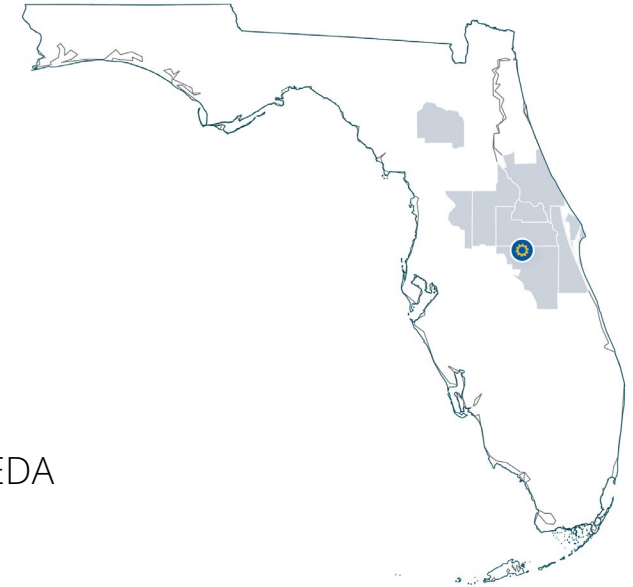
Advanced semiconductor packaging, digital twin advanced packaging design and manufacturing, county-owned fabrication facility

## Capital Commitments:

\$50 million from Florida Commerce and the Florida Department of Education; \$50 million from EDA Build Back Better Regional Challenge; \$49 million recently from U.S. Department of Defense

## Key Fact:

The 50,000 square foot campus is a unique model where the county owns the land and there is a high school on the campus



### Sampling of Partners (10)

ACADEMICS (3)

GOVERNMENT ENTITIES (1)

INDUSTRY (1)

NON-PROFIT (5)

UNIVERSITY OF CENTRAL FLORIDA

OSCEOLA COUNTY

SKYWATER TECHNOLOGY

ORLANDO ECONOMIC PARTNERSHIP





# ND Advanced Agriculture Technology Engine

## Lead Organization:

North Dakota State University

## Primary Societal Challenge:

Driving the agtech revolution by partnering with rural and tribal communities to spur inclusive economic development

## Innovations:

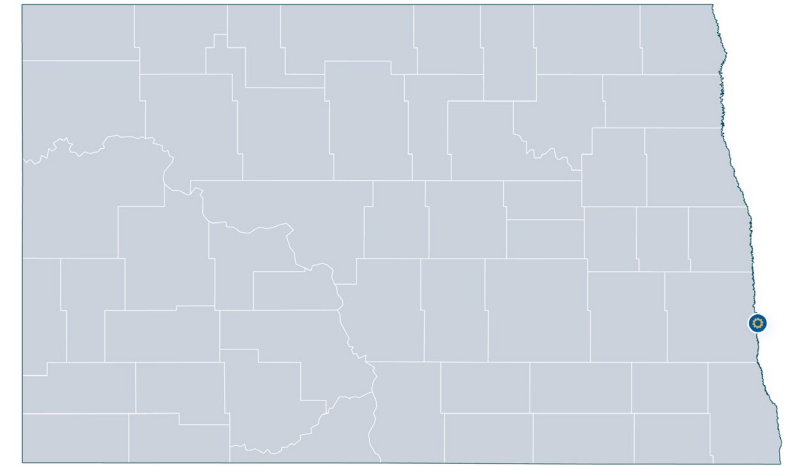
Crop genomics, climate modeling, advanced crop data, sensors

## Capital Commitments:

EDA Good Jobs Challenge Awardee, UAS FAA drone site

## Key Fact:

#1 U.S. producer of peas, beans, barley, canola, flax, oats, and wheat



### Sampling of Partners (65)

ACADEMICS (14)

GOVERNMENT ENTITIES (8)

INDUSTRY (32)

NON-PROFIT (11)

Tribal Entities (5)

UNIVERSITY OF MONTANA

NORTH DAKOTA GOVERNOR'S OFFICE

BANKNORTH, MICROSOFT (FARGO)

NORTH DAKOTA FARMERS UNION

NUETA HIDATSA SAHNISH COLLEGE



# Louisiana Energy Transition Engine

## Lead Organization:

Louisiana State University

## Primary Societal Challenge:

Advancing US's capacity for innovation in low-carbon energy with a focus on carbon capture and hydrogen

## Innovations:

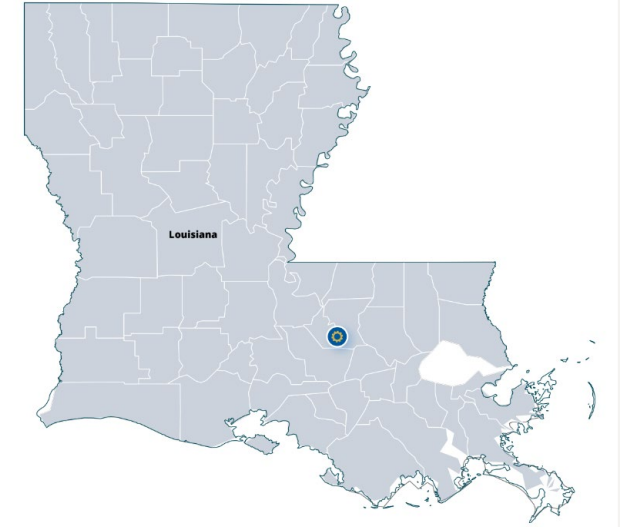
Carbon capture, hydrogen fuel, CO2 as feedstock, sustainable manufacturing for clean energy

## Capital Commitments:

\$67.5 million from state, EDA BBRC winner +Tech Hubs finalist

## Key Fact:

There are over 5,000 miles of oil, gas, chemical, H2 and CO2 pipelines in Louisiana



## Sampling of Partners (49)

ACADEMICS (13)

GOVERNMENT ENTITIES (5)

INDUSTRY (21)

NON-PROFIT (10)

DILLARD UNIVERSITY

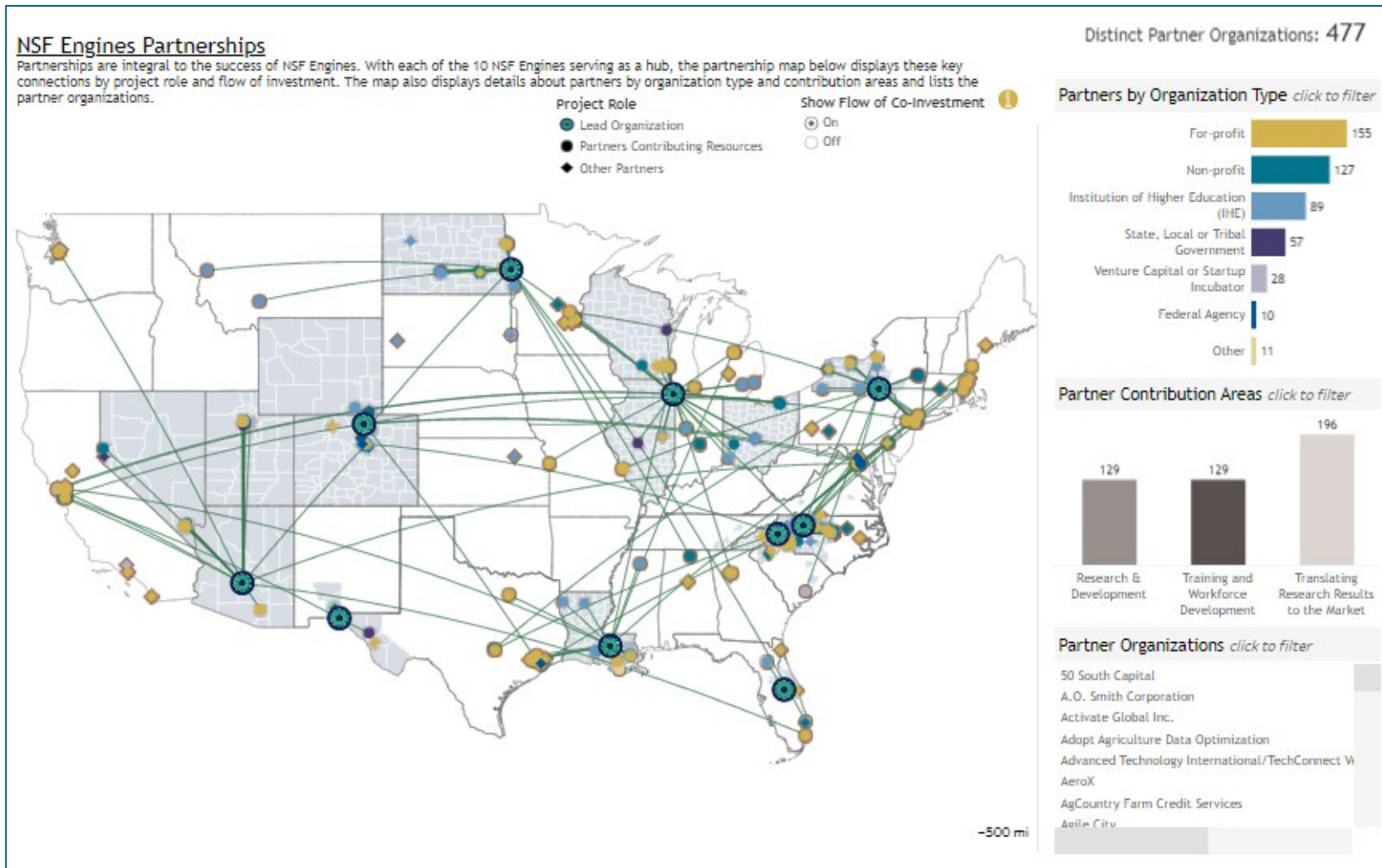
LOUISIANA ECONOMIC DEVELOPMENT

EXXONMOBIL, SHELL

SOUTH LOUISIANA ECONOMIC COUNCIL



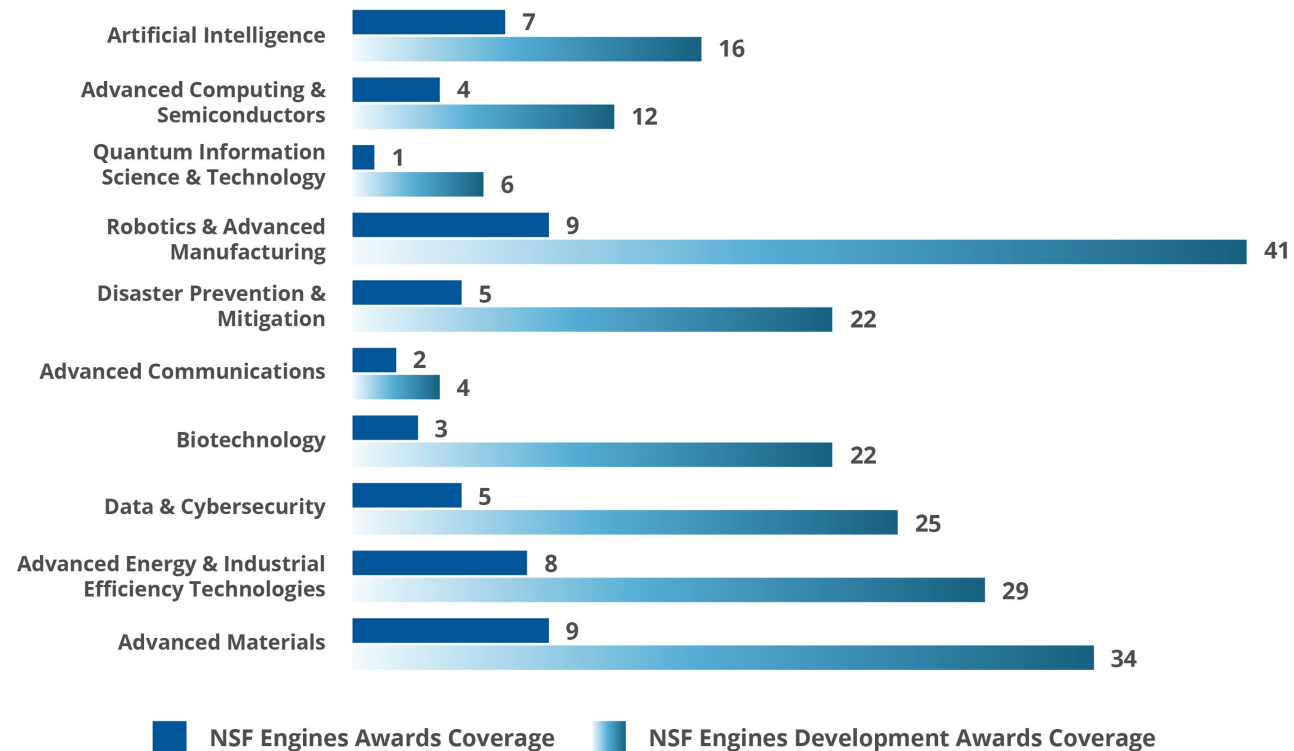
# NSF Engines Partnerships Network





# CHIPS and Science Act: Key Technology Focus Areas

## NSF ENGINES KEY TECHNOLOGY AWARDS AREA BREAKDOWN



# NSF Engines Builder Platform

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- Run by The Engine Accelerator, a public benefit corporation with origins at MIT.
- A unique post-award support model that will provide tailored resources and a high level of personalized engagement and support that will significantly contribute to the success of the NSF Engines program.
- The NSF Engines Builder Platform is a human-centered portfolio of support structures that empowers awardees with the tools, networks and capital needed to thrive.
- The Platform is inspired and informed by the support systems pioneered by venture incubators and accelerators, national philanthropy and lessons learned from prior place-based investment efforts.
- [BuilderPlatform@engine.xyz](mailto:BuilderPlatform@engine.xyz).



### **Enhancing Partnerships to Increase Innovation Capacity (EPIIC)** program

provides training and networking support to help build more inclusive innovation ecosystems and pathways into NSF Regional Innovation Engines.

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Awarded a total **\$19.6 million** to nearly 50 teams.

New funding opportunity is available. Deadline to apply is **May 16, 2024**.



Opportunity available to:



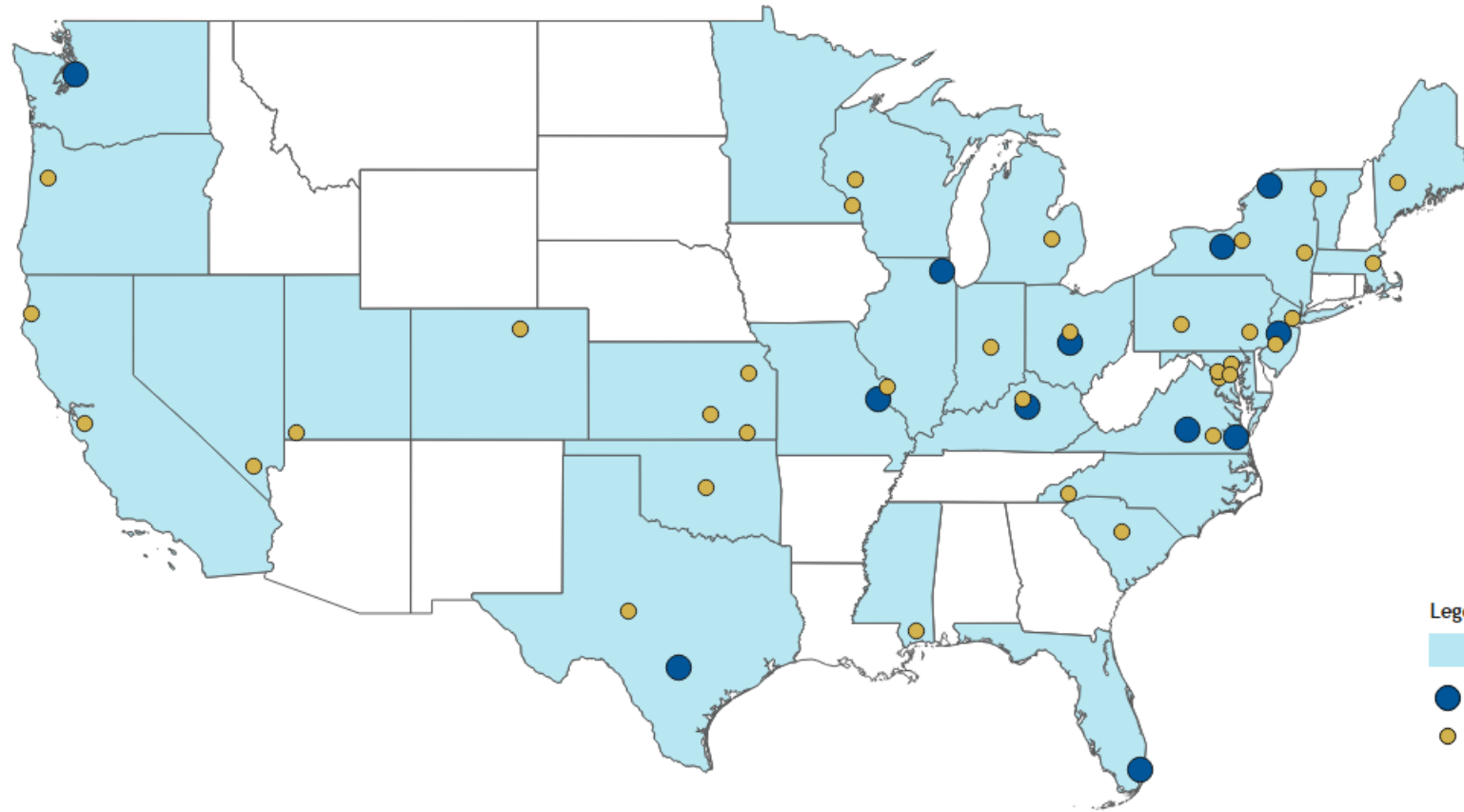
Academia



# Enabling Partnerships to Increase Innovation Capacity (EPIIC)

49

Number of Awards



**Legend**  
■ State with EPIIC Award  
● Lead Institution  
● Collaborative Institution

**49**  
 EPIIC Awards

New Awardee  
 N  
 Y

Awards in EPSCoR States  
 ■■■■■■■■■■ 12

Awards to MSIs  
 ■■■■■■■■■■ 14

**Organization Type**

Community College	4	14
Master's Colleges	3	14
Baccalaureate Colleges	4	7
Doctoral/Professional Universities	1	1
R1	1	

Alaska



Hawaii



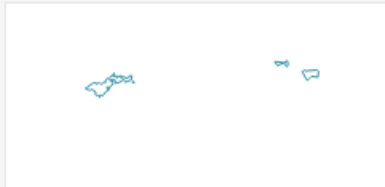
Mariana Islands & Guam



Puerto Rico & U.S Virgin Islands



American Samoa



# TIP's Core Message

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development



**Innovation Corps (I-Corps™)** provides experiential entrepreneurial education to further the nation's innovation ecosystem. Hubs implement the I-Corps program by creating a network of universities that help researchers learn how to test the market through customer discovery.

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**I-Corps Hubs** Funding for up to **\$3 million** per year for **5 years**

**10 I-Corps Hubs** involving nearly 100 universities

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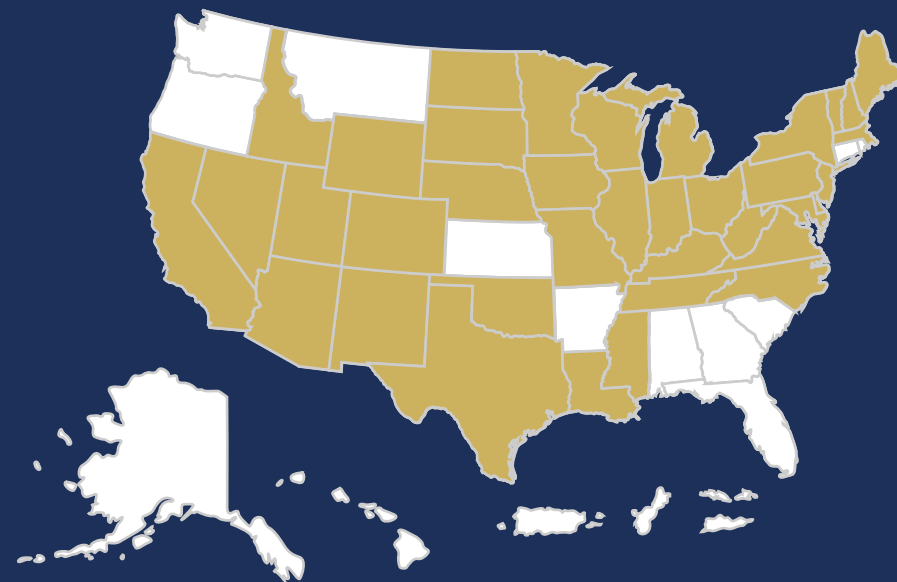
**I-Corps Teams** Funding for **\$50,000** for **7 weeks**



**CORPS**  
NSF Innovation Corps



All Hubs



Opportunity available to:



Academia







**America's Seed Fund powered by NSF** (the Small Business Innovation Research and Small Business Technology Transfer program) provides up to **\$2 million** in research and development funding for deep-tech startups, transforming scientific and engineering discoveries into products and services with commercial and societal impact.

Submit a Project Pitch to get started!

### PHASE I

6-12 months

Up to

**\$275,000**

### PHASE II

2 years

Up to

**\$1 million**

### PHASE IIB

Up to

**\$500,000**

CHIPS and  
Science Act  
2022



America's  
**SEED FUND**  
SBIR.STTR

Opportunity available to:



Academia



Business & Industry





## Pathways to Enable Open-Source Ecosystems

**(POSE)** supports sustainable high-impact open-source ecosystems to ensure more secure open-source products, increase coordination of developer contributions and a more focused route to impactful technologies.

Two Phases:

### PHASE I

1 year

Up to

**\$300,000**

### PHASE II

2 years

Up to

**\$1.5 million**



## Pathways to Enable Open-Source Ecosystems

Opportunity available to:



Academia



Business & Industry



Nonprofits





**Accelerating Research Translation (ART)** program supports institutions of higher education to build capacity and infrastructure to strengthen and scale the translation of basic research outcomes into impactful solutions.

---

Awarded more than \$100 million to **18 teams** at academic institutions across the nation.

**CHIPS and Science Act**  
2022

NSF  
National Science Foundation  
Directorate for Technology, Innovation and Partnerships

# ART

ACCELERATING RESEARCH TRANSLATION

Opportunity available to:

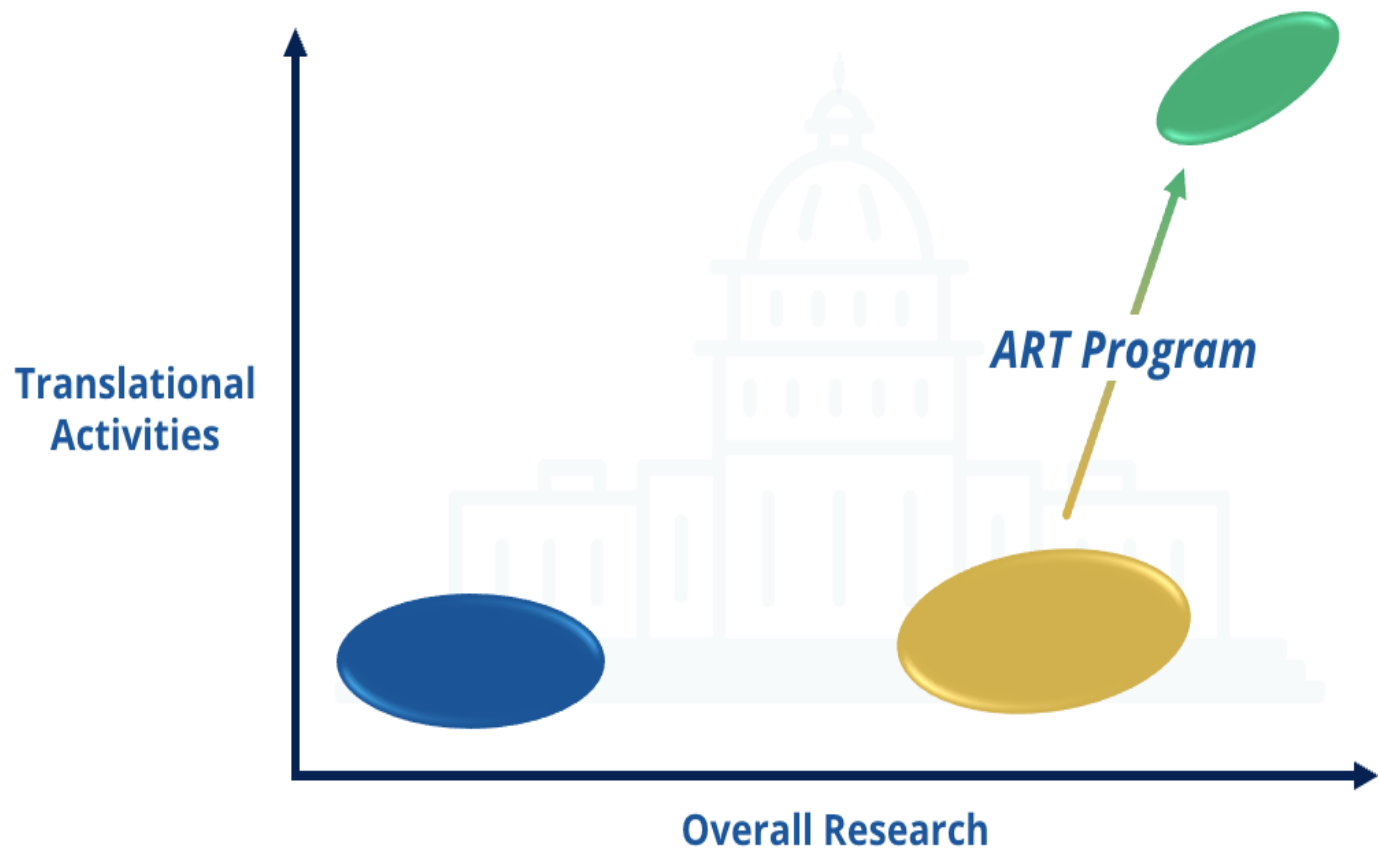
-  Academia







# TECHNOLOGY TRANSLATION AND DEVELOPMENT



CHIPS and  
Science Act  
2022



National Science Foundation  
Directorate for Technology, Innovation and Partnerships

# ART

ACCELERATING RESEARCH TRANSLATION

Opportunity available to:



Academia



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

## NSF ART Awards:

The NSF Accelerating Research Translation (ART) awards support institutions of higher education (IHEs) that seek to build capacity and infrastructure for translation of fundamental academic research into tangible solutions that benefit the public.

For more information, please visit the NSF ART program website. [↗](#)

Show ART Network ⓘ  
 On  
 Off

18 ART Awards Total

### Project Roles by Institution

(Each ART award includes a Lead Institution and Mentor Institution. Some awards also include a Partner Institution.)



### Lead Institution in EPSCoR Jurisdiction (Awards)

(EPSCoR: Established Program to Stimulate Competitive Research)



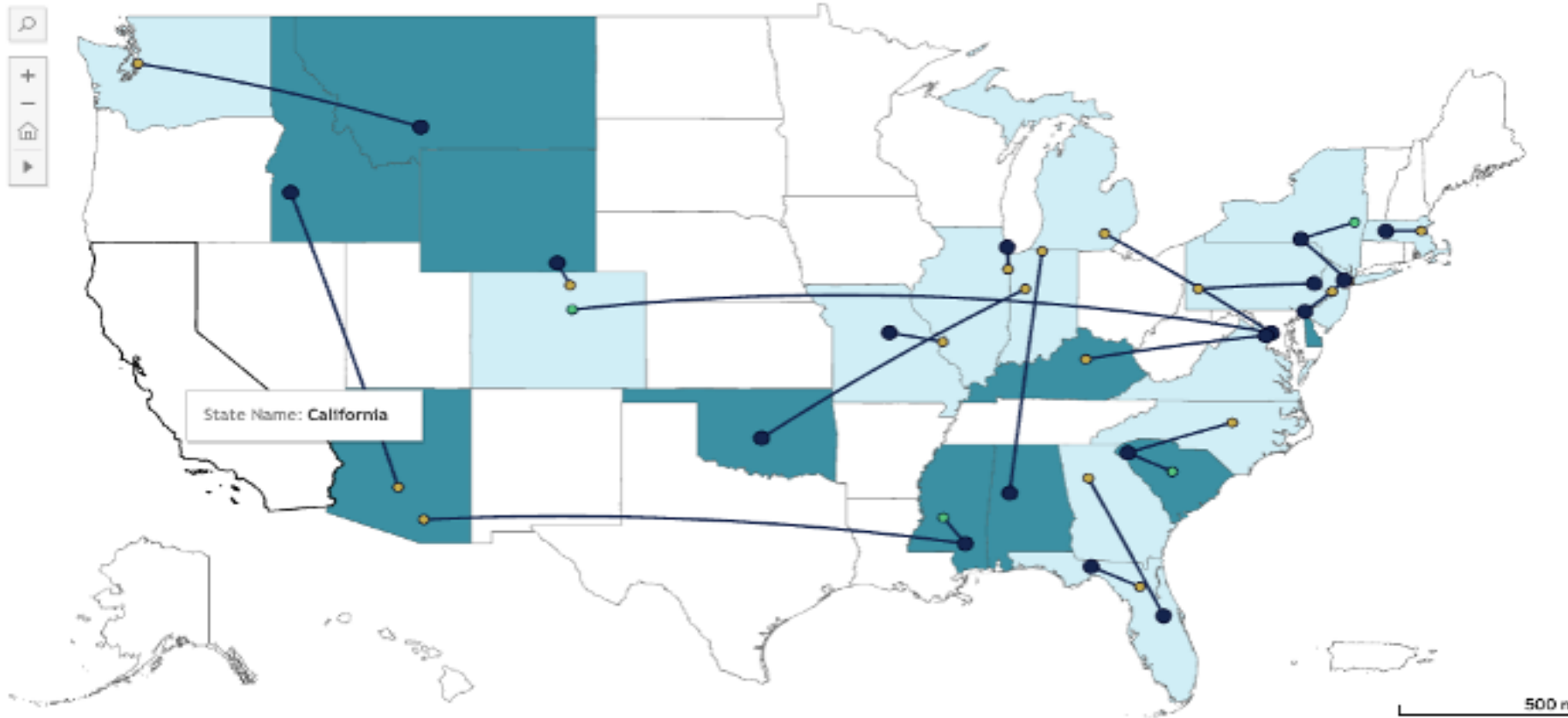
### Awards with Woman PIs (Lead Institutions)

(PI: Principal Investigator)



### Map Legend

- State with Lead, Mentor, or Partner Institution involved in ART award
- EPSCoR State with Lead, Mentor, or Partner Institution involved in ART award





### The Responsible Design, Development and Deployment of Technologies (ReDDDoT)

program is a collaboration with five philanthropic partners and crosses all disciplines of science and engineering. The program seeks to ensure ethical, legal, community and societal considerations are embedded in the lifecycle of technology's creation and use.

**\$16 million** program



Ford Foundation



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships



# ReDDDoT

Responsible Design, Development,  
& Deployment of Technologies

For more information visit:

<https://new.nsf.gov/funding/opportunities/responsible-design-development-deployment>



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Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development





## Experiential Learning for Emerging and Novel Technologies (ExLENT)

program promotes partnerships between organizations in emerging technology fields and those with expertise in workforce development to expand practical learning opportunities for individuals interested in entering or gaining more experience in emerging and novel technology.

NSF awarded **\$18.8 million** to **27 projects** over 3 years.



### Opportunity available to:



Academia



Business & Industry



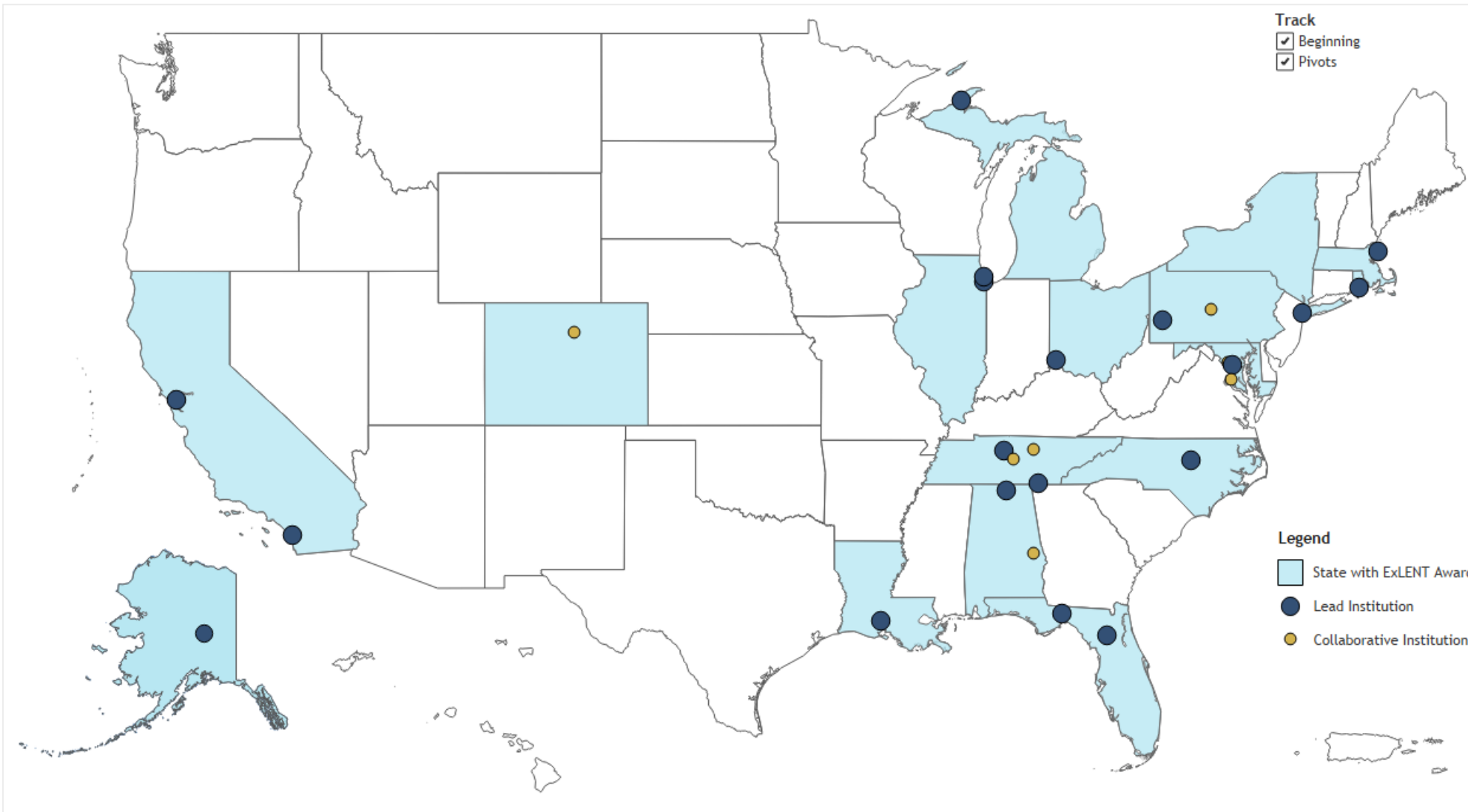
Governments



Nonprofits



# Experiential Learning for Emerging and Novel Technologies (ExLENT)



27

ExLENT Awards

Awards to MSIs

5

Awards in EPSCoR States

## Awards by Emerging Tech Area

Quantum Information Science & Technology	2	4
Semi Conductors & HPC	4	2
Biotechnology	5	0
Advanced Manufacturing & Robotics	4	0
Advanced Energy & Industrial Efficiency Technologies	2	1
Artificial Intelligence	2	1

## Awards by Organization Type

IHE	R1	8	2
	R2	5	2
	Baccalaureate College	1	2
	Master's College	2	1
	Community College	1	0
NGO		2	1





Through a \$20 million cooperative agreement, the **Entrepreneurial Fellowships** run by the non-profit, Activate.org, support researchers from a variety of backgrounds and geographies to move technologies from lab to market.

---

**2** years of training

At least **\$350,000** in direct support, plus specialized research facilities and equipment

# Activate

CHIPS and  
Science Act  
2022

Opportunity available to:



Individual Researchers





NSF funded the **Council of Graduate Schools** to expand data collection activities and help recruit graduate students in key technology areas. By collecting more data, universities will use data-driven decision making to address challenges in recruiting and retaining domestic graduate students underrepresented in STEM.

A combined nearly **\$5.8 million** over **4** years.



For more information:

**<https://new.nsf.gov/tip/updates/nsf-supports-council-graduate-schools-efforts>**



# TIP: Accelerating Research To Impact





# Find Your Opportunities



## Academia

- America's Seed Fund powered by NSF
- Accelerating Research Translation
- Convergence Accelerator
- Enabling Partnerships to Increase Innovation Capacity
- Experiential Learning for Emerging and Novel Technologies
- NSF Entrepreneurial Fellowships
- NSF Innovation Corps (I-Corps™)
- Partnerships for Innovation
- Pathways to Enable Open-Source Ecosystems
- Privacy-Enhancing Technologies Prize Challenge
- Prototype Open Knowledge Network
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies



## Business & Industry

- America's Seed Fund powered by NSF
- Convergence Accelerator
- Experiential Learning for Emerging and Novel Technologies
- Pathways to Enable Open-Source Ecosystems
- Pathways to Enable Open-Source Ecosystems
- Privacy-Enhancing Technologies Prize Challenge
- Prototype Open Knowledge Network
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies



## Government

- Convergence Accelerator
- Experiential Learning for Emerging and Novel Technologies
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies
- Visionary interdisciplinary Teams Advancing Learning Prize Challenge



## Nonprofits

- Convergence Accelerator
- Experiential Learning for Emerging and Novel Technologies
- Partnerships for Innovation
- Pathways to Enable Open-Source Ecosystems
- Prototype Open Knowledge Network
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies
- Visionary interdisciplinary Teams Advancing Learning Prize Challenge

# LEARN ABOUT TIP

- Funding opportunities
- Sign up for our newsletter
- Resources and upcoming events

[new.nsf.gov/tip/latest](https://new.nsf.gov/tip/latest)



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## Technology, Innovation and Partnerships

A new directorate at the U.S. National Science Foundation

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One year ago, under the leadership of Director Sethuraman Panchanathan, the U.S. National Science Foundation announced the establishment of the Directorate for Technology, Innovation and Partnerships, or TIP, the agency's first new directorate in more than 30 years.

Just a few months later, Congress passed the "CHIPS and Science Act," authorizing the establishment of the directorate and charging it with the critical mission of advancing U.S. competitiveness through investments that accelerate the development of key technologies and address pressing societal and economic challenges.

### Updates

[NSF invests more than \\$43 million in NSF Regional Innovation Engines Development Awards](#)

May 11, 2023

[NSF seeks input on novel approaches to emerging technology career pathways](#)

### > Learn More About TIP

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### > TIP Programs

[Accelerating Research Translation](#)





U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

## Questions?

- Email [tip@nsf.gov](mailto:tip@nsf.gov) or [egiancha@nsf.gov](mailto:egiancha@nsf.gov)
- Visit <https://new.nsf.gov/tip/>